

the CBL” appears. Press [ENTER] to go to the **MAIN MENU**. If the CBL and the calculator are not turned on and the link cable pushed in firmly at both ends, the message “Link Error” will appear. Be sure that the link cable is firmly pushed into the CBL and calculator and press the On button on the CBL.

3. Set up the calculator and CBL for a pressure sensor and calibration (in atmospheres).
 - a. Select **SET UP PROBES** from the **MAIN MENU**. Press [ENTER].
 - b. Enter “1” as the number of probes. Press [ENTER].
 - c. Select **PRESSURE** from the **SELECT PROBE** menu. Press [ENTER].
 - d. Enter “1” as the channel number. Press [ENTER].
 - e. Select **USE STORED** from the **CALIBRATION** menu. Press [ENTER].
 - f. Select **ATM** from the **PRESSURE UNITS** menu. Press [ENTER].
4. To collect pressure versus volume data:
 - a. It is best for one person to take care of the gas syringe and for another to operate the calculator.
 - b. Open the syringe to the atmosphere by turning the blue knob away from the syringe (so the arrow points toward black interface box). Move the piston so that the front edge of the black ring is lined up with the 20.0 mL line on the syringe. Turn the blue knob to the position shown in Figure 1 so the side arm is closed and the syringe is open to the pressure sensor.
5. Set up the calculator and CBL for data collection.
 - a. Select **COLLECT DATA** from the **MAIN MENU**. Press [ENTER].
 - b. Select **TRIGGER/PROMPT** from the **DATA COLLECTION** menu. Press [ENTER].
 - c. When the pressure reading has stabilized, press [TRIGGER] on the CBL. When prompted to “Enter Value”, type in the volume reading at the front edge of the black ring (20.0 mL for the first point). Press the [ENTER] key to store this pressure-volume data pair.
6. Select **MORE DATA** from the **DATA COLLECTION** menu to collect another data pair. Move the piston to 18.0, when the pressure reading has stabilized, press [TRIGGER] on the CBL. Type in the gas volume (in mL) on the calculator. Press the [ENTER] key to store this pressure-volume data pair. Repeat for volumes of 16.0, 15.0, 12.0, 10 , 8.0, 6.0 and 5.0 mL.
7. Select **STOP AND GRAPH** from the **DATA COLLECTION** menu when you have finished collecting data. Use right arrow key to examine the data points along the displayed graph of pressure vs. volume. As you move the cursor right or left, the volume (X) and pressure (Y) values of each data point are displayed below the graph.
8. Press [ENTER] to exit the graph.
9. Select **NO** which returns you to the **Main Menu**. Press [ENTER]. Select **Quit**. Press [ENTER].

Analyzing the DATA

Your task in this investigation is to describe the relationship and devise an equation for calculating the pressure of a specific volume of gas assuming that the temperature does not change. The volume data is in L1 and the pressure data is in L2.

1. Press **MODE**.
2. Highlight **NORMAL**. Press [ENTER].
3. Highlight **3** for the number of decimal places. Press [ENTER].
4. Press [QUIT] to return to the main screen.

Method of Analysis 1

1. From your graph, is pressure versus volume a linear relationship? If not, to see if an inverse relationship exists between pressure and volume, a graph of pressure vs. *reciprocal of volume*